

BLUE ECONOMY AND ECONOMIC DEVELOPMENT IN NIGERIA

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ABSTRACT

This study empirically examines the impact of the blue economy on economic development in Nigeria over the period 1990–2024, situating its analysis within the framework of sustainable growth and structural transformation theory. The blue economy was proxied by fishery production, aquaculture production, renewable freshwater resources, marine transportation, and marine tourism, while gross domestic product (GDP) per capita and the poverty rate served as indicators of economic development. Secondary data were obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin and the World Bank's World Development Indicators (WDI). The study employed the Augmented Dickey-Fuller (ADF) unit root test and the Auto-Regressive Distributed Lag (ARDL) bounds testing model to examine the stationarity properties and long-run equilibrium dynamics among the variables. Empirical results reveal that the blue economy exerts a statistically significant influence on Nigeria's long-run development trajectory. Specifically, fishery production and renewable freshwater resources exhibited a negative but significant relationship with poverty reduction, indicating possible inefficiencies and underutilization of natural capital. Conversely, aquaculture production, marine transportation, and marine tourism demonstrated positive and significant effects, suggesting their growing potential to stimulate inclusive economic expansion and enhance welfare. Moreover, marine tourism and renewable freshwater resources significantly improved GDP per capita, underscoring their critical role in productivity growth and foreign exchange generation. The study concludes that harnessing Nigeria's blue economy potential is vital for macroeconomic diversification, employment generation, and poverty alleviation. It recommends that the Federal Ministry of Agriculture and Rural Development, in collaboration with the Federal Ministry of Marine and Blue Economy, advance eco-efficient, innovation-driven fisheries and aquaculture policies that align with Sustainable Development Goals (SDG 8 and SDG 14) to achieve inclusive and resilient economic development.

Keywords: *Fishery Production, Marine Transportation, Renewable Freshwater Resources, Aquaculture Production, Marine tourism, Economic Development*

INTRODUCTION

Blue economy encompasses the economic activities related to oceans, seas and coastal areas has emerged as a critical driver of global economic growth. Therefore, the blue economy is seen in this study as the exchange of goods, services, and economic activities that are directly

linked to the ocean, seas and coastal areas, collectively known as the "blue economy." This trade encompasses a diverse range of sub-sectors that rely on marine and coastal resources, including maritime transport, fisheries, offshore energy, marine biotechnology and coastal tourism. In Nigeria, a country with an extensive coastline along the Atlantic Ocean, the blue economy represents a significant opportunity to enhance economic development. The concept of blue economy involves sectors such as fisheries, maritime transport, offshore energy, coastal tourism, and marine biotechnology, all of which contribute to the broader economy. Take for instance, the maritime transport involves the shipping and logistics industry, which facilitates the movement of goods across international waters (Adewale, 2020). The fisheries and aquaculture contribute through the trade of seafood and other marine products, including both wild-caught and farmed species.

Offshore energy, particularly the exploration, extraction, and trade of resources like oil, gas, and renewable energy from the ocean, plays a significant role in this trade. Marine biotechnology involves the development and trade of products derived from marine organisms, such as pharmaceuticals, cosmetics, and nutraceuticals (Ekpo & Chuku 2021). Coastal and marine tourism, which includes activities like beach resorts, cruise tourism, and various recreational activities, also forms a crucial part of the blue economy. According to Anikweet et al (2024) the extraction and trade of marine mineral resources, such as deep-sea mining for precious metals and rare earth elements, contribute to this sector. Blue economy is essential for the economic development of many coastal countries, providing jobs, supporting international trade flows, and contributing to sustainable development through the careful management of marine resources. It is imperative to note that as the world increasingly turns to the oceans for resources and economic expansion, understanding the impact of this trade on Nigeria's economic development becomes highly necessary. Nigeria's strategic location along the Gulf of Guinea makes it a hub for maritime activities, including shipping and oil exploration. According to the Nigerian Maritime Administration and Safety Agency (NIMASA), over 75% of Nigeria's external trade is conducted via the sea, with maritime transport alone contributing approximately 10% to the nation's Gross Domestic Product (GDP) in recent years. Moreover, the fisheries sector, which is a vital component of Nigeria's blue economy, provides employment to over 10 million people and contributes significantly to the country's food security and export revenues.

The Nigerian Maritime Administration and Safety Agency (NIMASA) in 2022 reports that maritime activities account for over 75% of Nigeria's external trade. However, inefficiencies in port operations and infrastructure have led to increased shipping costs and delays. For instance, the World Bank's Logistics Performance Index (LPI) highlights that Nigeria's port efficiency ranks lower than many of its peers, affecting overall trade performance and economic benefits. Additionally, the fisheries sector, which provides employment to more than 10 million Nigerians, has seen limited growth in export revenues (FAO, 2023). Despite the global seafood market being valued at approximately USD 400 billion annually, Nigeria's seafood exports account for a small fraction of this figure (FAO, 2023). This underperformance is partly due to illegal fishing practices, inadequate regulatory frameworks, and limited investment in sustainable aquaculture. Coastal tourism, another vital sector, has significant untapped potential. While global coastal and marine tourism is expected to grow at a rate of 4.5% annually, Nigeria's coastal tourism industry lags behind due to insufficient infrastructure, security concerns, and environmental degradation (WTTC, 2023). For example, the Nigerian Tourism Development Corporation (NTDC) indicates that the sector's contribution to GDP remains under 2%, despite Nigeria's rich coastal attractions (WTTC, 2023).

These problems are compounded by the lack of comprehensive policies and investments to harness the full potential of these sectors. As a result, Nigeria's blue economy has not achieved its potential impact on economic development, characterized by lower GDP contributions, limited job creation, and underutilization of marine resources. More so, previous studies have highlighted several critical issues regarding the impact of blue economy on economic development in Nigeria, but they also reveal significant gaps in understanding this relationship. The underutilization of Nigeria's blue economy is a recurring theme in the literature. Despite the country's vast maritime resources, including a coastline of over 853 kilometers and extensive exclusive economic zones, the contribution of maritime trade to Nigeria's national economy remains surprisingly low. Nwilo et al. (2019) pointed out that inefficient port operations, outdated infrastructure, and regulatory bottlenecks have significantly limited the effectiveness of the maritime sector in driving economic growth.

This underutilization is problematic because the blue economy, if fully harnessed, has the potential to significantly boost Nigeria's GDP, create jobs, and improve the country's trade balance. Further research by Akintoye and Sotola (2020) supports this perspective, showing that although maritime activities account for the majority of Nigeria's international trade volume, the sector contributes only about 1.5% to GDP. Additionally, the blue economy's contribution to employment is minimal, with most jobs concentrated in low-value, informal sectors such as artisanal fishing and small-scale maritime transport. This limited contribution underscores a critical gap in fully leveraging the blue economy to drive broad-based economic growth and job creation. Environmental degradation and weak regulatory frameworks have also been identified as significant barriers to the blue economy's impact on economic development. Adedayo et al (2021) argue that marine pollution, illegal fishing, and coastal erosion are degrading Nigeria's marine resources, leading to a decline in fisheries output and loss of biodiversity. Moreover, the study critiques the lack of effective regulation and enforcement, which has allowed unsustainable practices to persist, further weakening the blue economy's potential contribution to economic development.

Despite the recognition of these challenges, there is a notable gap in the literature concerning empirical studies that specifically examine the link between blue economy and economic development in Nigeria. Most existing research focuses broadly on the challenges facing the blue economy, such as infrastructure deficits and environmental concerns, without deeply exploring how specific international trade activities within the blue economy—like maritime shipping, fisheries exports, and coastal tourism—directly impact economic development indicators such as GDP growth, poverty reduction, and employment. Additionally, there is a lack of comprehensive policy analysis aimed at integrating blue economy into Nigeria's broader economic development strategies. Ukeje and Akanji (2022) highlight that while there are isolated initiatives to improve port infrastructure or combat illegal fishing, these efforts are not part of a cohesive national strategy that positions the blue economy as a key driver of economic growth.

To address these gaps, this article advances the debate by empirically investigating the impact of blue economy on economic development in Nigeria, spanning 1990–2023. This allowed the scope of the study to be broadened beyond what had been done in the past. According to the following format, the remainder of the work is organized as follows: after this introduction in section 1, part 2 would offer a fast survey of both theoretical and empirical literature. The methodologies of the study, including the definitions of the variables utilized in the research, are addressed in Section 3, while the findings are presented in Section 4. The work will be brought to an end in Section 5, which will include a short comment on the implications of policy and ideas.

LITERATURE REVIEW

Blue Economy

The blue economy has emerged as one of the most innovative paradigms in contemporary development discourse, redefining how societies perceive and utilise aquatic resources for sustainable growth. The term transcends traditional maritime or marine-based economies by emphasizing an integrated approach that harmonizes economic prosperity, social inclusion, and environmental sustainability. According to the World Bank (2017), the blue economy represents “the sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of ocean ecosystems.” This definition has gained wide institutional traction because it connects environmental stewardship with economic opportunity, offering a pathway for developing nations to transform their coastal and marine resources into engines of inclusive growth. Yet, studies have shown that while this definition is aspirational and mobilizes cross-sectoral collaboration, its effectiveness depends heavily on measurable governance indicators and coherent institutional frameworks (Independent Evaluation Group [IEG], 2024).

Expanding on this perspective, the United Nations Environment Programme (UNEP, 2024) defines the blue economy as an economic system that promotes “the sustainable use of ocean and freshwater resources to enhance human well-being and social equity while significantly reducing environmental risks and ecological scarcities.” This definition introduces a broader moral and ecological dimension—framing the blue economy as a pathway toward ecosystem restoration, biodiversity protection, and community resilience. It aligns closely with the Sustainable Development Goals (SDGs), particularly SDG 14, which advocates for the conservation and sustainable use of the oceans, seas, and marine resources. However, researchers caution that although this ecosystem-based perspective provides a strong ethical and environmental foundation, it risks becoming overly normative unless accompanied by clear policy tools, spatial planning, and quantifiable performance metrics (UNEP, 2024; OECD, 2024). Scholars such as Elston, et al (2024) argue that this version of the blue economy is conceptually compelling but must be grounded in tangible governance mechanisms to avoid the pitfalls of what they term “bluwashing”—labeling projects as sustainable without sufficient evidence of ecological or social benefit.

In contrast, the European Union’s conception of the blue economy—often referred to as “blue growth”—emphasizes the role of oceans as frontiers for economic innovation, industrial diversification, and technological advancement (European Commission, 2023). This definition focuses on stimulating investment and job creation in marine sectors such as tourism, fisheries, renewable energy, and biotechnology. Empirical assessments reveal that the EU’s blue growth agenda has successfully increased GDP contributions from marine industries and fostered technological competitiveness across Europe (OECD, 2024). However, it has also faced criticism for prioritizing economic expansion over environmental thresholds, leading to subsequent policy reforms that integrate sustainability safeguards and marine spatial planning (European Commission, 2023). Thus, while the EU’s growth-oriented framing has proven effective in stimulating innovation and industrial development, its long-term success depends on balancing economic dynamism with ecosystem protection.

In essence, the blue economy should be conceptualized as an evolving paradigm that bridges environmental ethics, social justice, and economic pragmatism. The World Bank’s development-oriented view provides a practical blueprint for policy implementation, UNEP’s ecological definition embeds moral and sustainability imperatives, and the EU’s innovation-

driven approach energizes technological advancement and global competitiveness. Together, they form a complementary triad—a holistic vision of human progress anchored in the oceans and inland waters. The convergence of these expert perspectives illustrates that the blue economy is not merely a policy slogan but a transformative model for inclusive and sustainable development. By embedding science-based governance, local participation, and technological innovation into its operational framework, nations—particularly developing coastal states such as Nigeria—can harness the blue economy as a catalyst for both environmental resilience and economic renaissance.

Economic Development

Economic development remains one of the most compelling and evolving concepts in economics and public policy, embodying the aspirations of nations to achieve sustained prosperity, equity, and human dignity (Uford, 2017; Akpan & Uford, 2024). Unlike the narrower notion of economic growth—which merely measures increases in national output—economic development encompasses qualitative transformations in a nation’s productive structure, social institutions, and human welfare. Todaro and Smith (2015) describe it as a multidimensional process involving “major changes in social structures, popular attitudes, and national institutions, as well as acceleration of economic growth, reduction of inequality, and eradication of poverty.” This classical definition situates development not only in the expansion of income but in the reorganization of entire societies toward inclusiveness and capability enhancement. Empirical analyses by the World Bank (2014) affirm that sustainable development must combine growth with institutional strength and equitable distribution if it is to meaningfully reduce poverty and improve living standards. Thus, scholars generally agree that growth is a necessary condition for development—but not a sufficient one. A significant shift in the theoretical discourse came with Amartya Sen’s capability approach, which reconceptualized development as freedom. Sen (1999) argues that economic development should be assessed by the extent to which individuals enjoy substantive freedoms—such as education, health, political participation, and access to opportunities—rather than by the accumulation of income or wealth alone.

This human-centered perspective transformed how policymakers measure progress, giving rise to the Human Development Index (HDI) and other multidimensional poverty measures. Studies such as Levine (2023) validate Sen’s argument by showing that countries with sustained investments in human capital, literacy, and health experience more resilient and inclusive development trajectories, even when their GDP growth is modest. In this light, economic development becomes a moral and social project—one that enhances human agency and expands the choices people have to lead lives they value. Contemporary scholars further refine these foundational definitions by integrating institutional and structural dimensions. Gollin (2023) emphasizes that genuine development requires structural transformation—the reallocation of labor and capital from low-productivity sectors like subsistence agriculture to higher-productivity manufacturing and services, underpinned by innovation and institutional effectiveness. This view situates development as a dynamic process that involves technological adaptation, governance reform, and the creation of inclusive markets. It resonates with the World Bank’s (2023) Long-Term Growth Model, which highlights the interplay between macroeconomic stability, institutional quality, and human capital formation as the engines of sustainable development. Empirical findings from this framework reveal that nations combining sound fiscal management with investments in education, health, and infrastructure

exhibit stronger resilience to external shocks and more equitable growth outcomes (World Bank, 2023).

In essence, the concept of economic development can be visualized as a synthesis of three intellectual traditions. The classical structuralist view (Todaro & Smith, 2015) anchors development in productive transformation and modernization; the humanistic view (Sen, 1999) centers it on freedom, equity, and human capability; and the institutionalist perspective (World Bank, 2023; Gollin, 2023) underscores the role of governance, innovation, and policy coherence. When integrated, these frameworks present development as both a process and a goal—one that combines growth with justice, innovation with inclusion, and progress with sustainability.

Theoretical Framework

Blue Economic Theory

The blue economy was proposed by Paul in 2010. The theory argue that the ocean is an underutilized economic frontier with immense potential to contribute to global and national economies. Proponents of the theory believe that by investing in sectors like fisheries, maritime transport, tourism, marine biotechnology, and renewable energy (such as offshore wind), countries can significantly boost their GDP while also addressing environmental challenges. For instance, proponents highlight how sustainable fishing practices can both protect marine ecosystems and ensure the long-term viability of the fishing industry. A country like Norway, which has implemented stringent regulations on fishing quotas and practices, is often cited as an example where the blue economy has been successfully integrated into national policy, leading to a thriving fishing industry that supports local economies while preserving fish stocks. Proponents argue that advancements in marine biotechnology, such as the development of pharmaceuticals from marine organisms, can lead to new industries that provide economic benefits without degrading marine ecosystems. For example, the discovery of new compounds in marine organisms has led to the development of novel drugs and treatments, showcasing the potential of the blue economy to contribute to human health and economic growth simultaneously.

However, the application of Blue Economic Theory in Nigeria is not without its challenges, and critics argue that several assumptions of the theory may not hold in the Nigerian context. One major concern is the risk of overexploitation of marine resources. Despite regulations, illegal fishing practices are rampant in Nigeria, leading to declining fish stocks and damaged ecosystems. The assumption that economic growth and environmental sustainability can go hand in hand is challenged by the reality that weak enforcement of fishing regulations and the lack of sustainable practices threaten the long-term viability of Nigeria's fisheries. This overexploitation also disproportionately affects small-scale and artisanal fishers, who rely on these resources for their livelihoods. Another criticism is the significant infrastructural and investment barriers that Nigeria faces in fully realizing the potential of its blue economy. The maritime transport sector, for example, suffers from inadequate port facilities, outdated infrastructure, and logistical challenges. These issues limit Nigeria's ability to compete in global maritime trade and hinder the efficient movement of goods. This theory is relevant to the study because by focusing on blue economy—such as fisheries, coastal tourism, and renewable marine energy—this theory underscores the transformative power of the sea in enhancing livelihoods and creating jobs. Imagine a thriving coastal community where vibrant fisheries, bustling seaside resorts, and innovative marine energy initiatives not only boost the economy but also protect the precious ecosystems that sustain them. Embracing this holistic

approach can unlock new avenues for growth while ensuring that the beauty and richness of Nigeria's maritime heritage are preserved for generations to come.

Sustainable Development Theory

In 1987, Brundland initiated the sustainable development theory. The theory promotes a balanced approach to development, advocating for economic growth while ensuring environmental protection and social equity. The theory argues that integrating these three pillars—economic, environmental, and social goals—can lead to long-term benefits. For instance, the United Nations' Sustainable Development Goals (SDGs) embody these principles by aiming to eliminate poverty, protect ecosystems, and promote social justice. An example of this integration is SDG 14, which focuses on sustainable marine practices to preserve biodiversity while supporting coastal economies. Supporters of the theory such as Rockström et al. (2009), and Sen, (1999) also highlight that investing in sustainable practices can lead to long-term economic gains. For example, Denmark's investment in wind energy has not only reduced its carbon footprint but also spurred the growth of a robust green technology sector, generating economic benefits and job creation. Additionally, adopting green building practices, such as those following LEED certification, improves urban living conditions by reducing energy consumption and enhancing the health of residents.

However, there are challenges and criticisms related to implementing sustainable development in Nigeria. Critics argue that the initial costs of adopting green technologies and sustainable practices can be prohibitive for the country's economy. For example, transitioning to renewable energy requires significant investment, which may strain Nigeria's financial resources. There are also concerns that stringent environmental regulations could impact industries crucial to Nigeria's economic development, such as oil and gas. Balancing environmental protection with economic growth in these sectors remains a complex issue. Implementation challenges are also significant. Ensuring compliance with environmental regulations and managing resources sustainably can be difficult, given the scale of informal and illegal activities, such as unregulated fishing and deforestation (Adejumo, 2005). Effective enforcement and regulatory frameworks are essential to overcoming these obstacles and achieving sustainable development goals.

Empirical Review

Eto and Okon (2025) examined the impact Assessment of Maritime Transportation Infrastructure on Nigeria's Economic Growth and Development". Their study covered the period from 1990 to 2020 and analyzed the relationship between maritime infrastructure development and economic performance in Nigeria. Variables included GDP growth rate, number of functioning seaports, cargo handling capacity, and maritime capital expenditure. Data were collected from the National Bureau of Statistics and analyzed using Ordinary Least Squares (OLS) regression analysis. The results showed that improved maritime infrastructure had a statistically significant and positive effect on Nigeria's GDP. The authors concluded that robust investments in port infrastructure, equipment, and policy frameworks are critical to driving economic growth. Similarly, Eyüboğlu and Akmermer (2024) analysed the effect of fisheries production on economic growth by employing the Auto Regressive Distributed Lag (ARDL) model from 1990-2019. The results showed a positive relationship between fisheries production and economic growth in the long-term. We hope this paper will support the policy-

makers and development agencies in their efforts to reshape the industry in Türkiye towards an increased role in economic development in a sustainable manner.

Osuji and Agbakwuru (2024) examined ten important blue economic components and evaluate their contributions to the sustainable development of Nigeria using various secondary data acquisition. Data obtained reveals that out of the ten (10) blue economic components studied, oil/gas exploration, maritime transport/shipping and fisheries dominate the blue economic contributions with the oil/gas exploration contributing 90% of the blue economic value in Nigeria. This work has shown that efforts are required both from the government and private sectors to pursue the huge opportunities available especially in the non-oil/gas exploration components to sustainably improve the economic base of the nation and generate huge employment opportunities for the large growing Nigerian population. Also, Amao et al. (2024). Maritime piracy and the sustainable development of Nigeria's blue economy. *Àgídígbo: ABUAD Journal of the Humanities*, 12(2), 605–620. The study examined how piracy in the Gulf of Guinea adversely affects fishing, maritime tourism, and trade. Through mixed-methods (key informant interviews and stakeholder surveys), a strong negative correlation was found between piracy incidents and blue economy performance. The authors recommended enhanced maritime security diplomacy and regional cooperation.

Eyo et al. (2024). Sustaining the blue bounty: fish, food, and nutrition security in Nigeria's evolving blue economy. *AIMS Agriculture and Food*, 9(2), 500–530. This study explored fisheries' role in national food security and blue economy growth. It reviewed dietary data and fisheries output, concluding that fish provides ~40% of national protein intake and that sustainable fisheries expansion is vital for meeting SDG 2 (Zero Hunger). Additionally, Umenweke and Bielu (2024). The introduction of the blue economy and its implications on the Nigerian tax regime. *International Journal of Comparative Law and Legal Philosophy*. This doctrinal legal analysis examined how broadening the tax base to include blue economy sectors (fisheries, aquaculture, maritime transport, coastal tourism) could enhance revenue while ensuring ecosystem sustainability. It concluded tax reforms should align fiscal frameworks with sustainable maritime asset utilization. Still, Oti et al. (2024) investigated the implications of blue economy to industrial growth in Port Harcourt Metropolis, Rivers State, Nigeria. *African Banking and Finance Review Surveying 180 stakeholders across fisheries, tourism, transport, and policy*, the study found blue economy contributes ~35% to Rivers State's GDP. Challenges include environmental degradation, infrastructural deficits, and weak regulation.

Olaniyi et al. (2024) examined the effect of blue economic practices and its potential implications on Nigeria's socio-economic development: a comprehensive analysis. The study employed policy and sectoral analysis to assess fisheries, aquaculture, maritime transport, oil/gas, and tourism. It found blue economy practices boost employment, food security, and foreign exchange earnings, but face threats from overfishing, pollution, and weak infrastructure/regulation. Correspondingly, Uzonwanne et al. (2023) investigated the impact of Fish Production on the Gross Domestic Product in Nigeria," focused on the national level. Variables included fish production, gross fixed capital formation, labor productivity, and GDP. Data were collected from secondary sources like the World Bank and analyzed using ordinary least squares (OLS) regression. Findings showed that fish production and capital formation positively influence GDP, while labor productivity had a negative impact. The study concluded that fish production can boost GDP and requires policy support. Consequently, Umar and Bello (2023) evaluated access to microcredit and performance of small-scale fish farmers in Zamfara State" used variables such as loan amount, repayment rate, fish output, and income level. Data were collected from 100 microcredit beneficiaries and analyzed using regression analysis. The

study found a positive relationship between microcredit access and fish production. The conclusion emphasized the need for expanding microcredit programs.

Onuwa et al. (2023) examined the impact of catfish productivity among smallholders in Ekeremor, Bayelsa State, Nigeria," focused on smallholder catfish farmers in Ekeremor. The variables used included quantity of feed, labor, capital input, pond size, and revenue. Data were collected through structured questionnaires. Methods of data analysis included descriptive statistics, cost-benefit analysis, and Total Factor Productivity (TFP). The findings showed that catfish farming is profitable, with a net farm income of ₦478,000 per cycle, though 68.3% of farmers were sub-optimally productive. The study concluded that access to quality feed and markets is crucial for improving productivity. Furthermore, Bamidele and Bolarinwa (2023) explored the role of Government Policies in Enhancing Aquaculture's Contribution to Economic Development". This study covered the period 1999 to 2020 using time-series data. The main variables were government spending on aquaculture, aquaculture output, GDP, and employment. The ARDL bounds testing approach was applied to determine long-run relationships. Findings showed that public investment significantly influenced aquaculture output and, by extension, economic growth. The study concluded that stable and supportive government policies are critical to unlocking the economic potential of aquaculture.

Akinyemi and Alege (2023) explored the effect of Shipping Trade on Economic Growth in Nigeria: The Vector Error Correction Model Approach." The study focused on the Nigerian economy and explored the impact of shipping trade on economic growth using data spanning from 1981 to 2019. The key variables included GDP as the dependent variable, and independent variables such as shipping trade index, port throughput, and maritime investment. The study employed secondary data sourced from the Central Bank of Nigeria and the Nigerian Ports Authority. The analysis was carried out using the Vector Error Correction Model (VECM). The findings revealed that shipping trade positively and significantly influenced economic growth in both the short run and long run. The study concluded that investing in maritime infrastructure and policy reforms could bolster Nigeria's economic development.

Similarly, Maria et al. (2023) evaluated the impact of fish production on the gross domestic product (GDP) in Nigerian by using time series data ranging from 1981-2021. In the method, Solow version of Neo-classical theory was used for theoretical framework. The study adopted ordinary least square techniques for the regression analysis. Aside the two main variables of this study which is fish production and GDP, some control variables were also used (Labour productivity and gross fixed capital formation) to control GDP. The main contribution of this study therefore lies in the result that shows that fish production and GFCF has positive and significant impact on economic growth in Nigeria while labour productivity has negative impact on the Nigeria economic growth. This means that labour productivity does not contribute to economic growth in Nigeria. Hence, the study recommends that the Nigerian government should encourage fish production in order to bring more inflow of funds which will help to trigger economic growth. This as a matter of fact could be achieved by reducing the contamination of the seas and oceans for a better output of aqua products in Nigeria.

Vanessa and Jacob (2023) the impact of the blue economy on economic growth, expressed as gross domestic product with Seychelles as a case study. The multiple regression model was used to analyze the quantitative data in SPSS Version 20 and Wordstat 7 software for the qualitative data. Results showed that employment of foreign workers in the blue economy and exporting goods via Port Victoria were significant at the 5% level. Employment in the fishery sector for foreign workers increased steadily from 2009 to 2022. Moreover, tourism and fisheries are the primary sources of employment in Seychelles, providing employment directly

and indirectly to about 75% of the Seychellois population. Fish production was the only variable that wasn't significant. While the annual fish production in Seychelles is 326,806 MT, a steady increase has occurred between 2005 and 2022. Furthermore, information gathered from the key informants indicated an increase in the partnership Seychelles has signed with the European Union, Mayotte, Taiwan, Mauritius, China and Korea. The export of goods averaged 40.88 million USD from 2005 until 2023, reaching an all-time high of 82.51 million USD in March 2019 and a record low of 7.83 million USD in January 2021. Seychelles is still largely a mono-economy and highly dependent on tourism. Therefore, the blue economy offers enormous potential for diversification and the Blue Economy Roadmap of Seychelles should be revised to achieve this objection.

Odey (2023) investigated the blue economy and its impact on the economic growth of the Niger Delta region and the Nigerian state. The findings reveal that the blue economy contributes to Employment, Job Creation, and Poverty Eradication, while also addressing challenges such as Ending Hunger, Securing Food, Promoting Physiological condition and Sustainable Fisheries, Sustainable Energy and Natural Resources, Innovative Industries, and fostering People, Culture, Communities, and Societies. However, the study highlights various challenges facing the blue economy, including sea piracy, illegal arms trafficking, terrorism, the destruction of maritime ecosystems, pollution, global climate change, and the over-reliance on oil and gas, particularly among the Niger Delta states. The survival of the blue economy is intricately linked to addressing these challenges. To address these issues, the study recommends comprehensive policy reforms to enhance the blue economy. Additionally, it suggests the employment of youths as coast guards along waterways and deep-sea areas to mitigate sea piracy and related problems. The establishment of maritime education and skills training centres/schools and the formulation of policies that extend beyond the oil sector are also recommended for each Niger Delta state and the Nigerian nation.

Adepoju, et al (2023) investigated the impact of blue economy on sustainable economic development in Nigeria. Utilizing interviews in coastal communities (Lagos, Delta, Akwa Ibom, Bayelsa, Rivers) and secondary GDP-maritime revenue data, the study identified Blue Economy potentials (hydropower, pharmaceuticals, tourism) but warned against risks (security, bunkering, smuggling, FDI). It called for ecosystem-sensitive resource exploitation. While, Ezenagu (2022) examined the role of coastal tourism in economic diversification. Through trend analysis and descriptive statistics, the study analyzed coastal tourism revenue (independent variable) and its effect on regional economic output (dependent variable). Findings showed increasing coastal tourism revenues in southern Nigeria, with a strong multiplier effect on service industries. The study concluded that tourism development should be integrated into Nigeria's economic diversification strategy. Finally, Olaniyan and Ojo (2022) analyzed how the blue economy supports economic diversification. Using econometric modeling and policy impact analysis, the study focused on investment in coastal infrastructure (independent variable) and non-oil GDP (dependent variable). Results showed that coastal infrastructure investment had a statistically significant positive effect on non-oil sector growth. The study emphasized that the blue economy is a viable alternative to Nigeria's oil-dependent model.

Gap and Value Addition

A critical review of the empirical studies reveals that while numerous scholars have examined aspects of the blue economy and its relationship with economic development, significant gaps persist across variables, scope, location, and methodology. Most of the existing studies such as those by Eto and Okon (2025), Akinyemi and Alege (2023), and Eyüboğlu and Akmermer

(2024) focused narrowly on individual components of the blue economy such as maritime transport, shipping trade, or fisheries production. Although these studies provide valuable insights, they fail to integrate multiple dimensions of the blue economy, particularly fishery production, aquaculture production, renewable freshwater resources, marine transportation, and marine tourism, within a single empirical framework. Furthermore, many of the studies measured economic growth solely through gross domestic product (GDP), overlooking vital indicators of economic development such as poverty reduction and improvements in living standards. This creates a conceptual limitation, as GDP growth does not necessarily reflect equitable or sustainable development.

The scope and location of existing studies further highlight a research gap. While some studies such as those by Oti et al. (2024), Odey (2023), and Adepoju et al. (2023) focused on specific regions like the Niger Delta or Rivers State, others like Vanessa and Jacob (2023) and Eyüboğlu and Akmermer (2024) examined foreign contexts such as Seychelles and Türkiye. There is, therefore, limited empirical evidence addressing the blue economy's impact on economic development at the national level in Nigeria. A national study that captures the combined influence of marine and inland blue economy resources on key welfare indicators is largely missing in existing literature. In terms of methodology, several studies such as Uzonwanne et al. (2023) and Maria et al. (2023) relied on simple econometric models like Ordinary Least Squares (OLS) and descriptive trend analyses, which are inadequate for examining both short-run and long-run relationships among variables that are likely integrated of different orders. Only a few, such as Bamidele and Bolarinwa (2023), employed more advanced techniques like the Auto-Regressive Distributed Lag (ARDL) model, but their scope was limited to specific subsectors such as aquaculture or fisheries without considering renewable freshwater resources and marine tourism. Moreover, most of the reviewed studies did not conduct cointegration or causality analyses, which are crucial for understanding the direction, stability, and long-term sustainability of relationships between blue economy indicators and economic development outcomes.

Given these gaps, it is evident that comprehensive research linking fishery production, aquaculture production, renewable freshwater resources, marine transportation, and marine tourism to economic development indicators such as poverty rate and GDP per capita within a unified econometric framework is lacking in Nigeria. The present study seeks to bridge this gap by employing robust time series techniques such as the ARDL bounds testing approach to examine both short-run and long-run dynamics between the blue economy and economic development in Nigeria from 1990 to 2024. This study contributes to the literature by offering a more holistic, nationally representative, and methodologically rigorous assessment that can inform sustainable policy interventions and blue economy development strategies in Nigeria.

METHODOLOGY

Secondary data, which were gathered from the Central Bank of Nigeria (CBN), statistical Bulletin and World Bank's World Development Indicators, 1990 to 2024, are the primary source of information for this research. Fishery Production (FPD), Aquaculture Production (ACP), Renewable Freshwater Resources (RFR), Marine Transport (MTP) and Marine Tourism (MTR), were used to proxy the blue economy while Gross Domestic Product Per Capita (GDPPC), and Poverty (POR) were used to capture economic development. The Augmented Dickey Fuller (ADF) method was used in order to do the unit root test on the model

that was developed. Taking into consideration the results of the ADF, the research used the Auto-regressive Distributive Lag (ARDL)

Model Specification

Following the specific objectives of this study, the functional form of the model is specified as follows:

Model One (Blue Economy and Poverty Model)

$$POR = f(FPD, ACP, RFR, MTP, MTR) \quad (1)$$

$$POR = \pi_0 + \pi_1 FPD + \pi_2 ACP + \pi_3 RFR + \pi_4 MTP + \pi_5 MTR \quad (2)$$

$$POR = \pi_0 + \pi_1 FPD + \pi_2 ACP + \pi_3 RFR + \pi_4 MTP + \pi_5 MTP + U_t \quad (3)$$

Where:

POR = Poverty Rate, **FPD** = Fishery Production, **ACP** = Aquaculture Production, **RFR** = Renewable Freshwater Resources, **MTP** = Marine Transport, **MTR** = Marine Tourism, π_0 = constant parameter, $\pi_1 - \pi_5$ = slope parameters, U_t = Error Term

Apriori Expectation: $\pi_1, \pi_2, \pi_3, \pi_4$, and $\pi_5 < 0$,

The signs of $\pi_1, \pi_2, \pi_3, \pi_4$, and π_5 are expected by theory to have a negative relationship with poverty rate as a surrogate for economic development in Nigeria. Since increase in FPD, ACP, RFR, MTP and MTR will create job opportunities, boosts local incomes, and fosters economic development in coastal communities through the blue sub-sectors activities.

Model Two Blue Economy and Gross Domestic Product Per Capita Model

$$GDP-PC = f(FPD, ACP, RFR, RME, MTR) \quad (4)$$

$$GDP-PC = \alpha_0 + \alpha_1 FPD + \alpha_2 ACP + \alpha_3 RFR + \alpha_4 MTP + \alpha_5 MTR \quad (5)$$

$$GDP-PC = \alpha_0 + \alpha_1 FPD + \alpha_2 ACP + \alpha_3 RFR + \alpha_4 MTP + \alpha_5 MTR + U_t \quad (6)$$

Where:

GDP-PC = Gross Domestic Product Per Capita, **FPD** = Fishery Production, **ACP** = Aquaculture Production, **RFR** = Renewable Freshwater Resources, **MTP** = Marine Transport, **MTR** = Marine Tourism, α_0 = constant parameter, $\alpha_1 - \alpha_5$ = slope parameters, U_t = Error Term

Apriori Expectation: $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ and $\alpha_5 > 0$

The signs of $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ and $\alpha_5 >$ are expected by theory to have a positive relationship with gross domestic product per capita as a proxy for economic development in Nigeria. Since increase in FPD, ACP, RFR and MTP will boost national output and attract foreign investment, leading to higher revenues. This, in turn, can increase the average income per person, or GDP per capita, improving living standards and potentially reducing poverty in coastal and surrounding regions.

$$POR_t = \pi_0 + \pi_1 LFPD_t + \pi_2 LACP_t + \pi_3 LRFR_t + \pi_4 LMTP_t + \pi_5 LMTR_t + U_t \quad (7)$$

$$LGDP-PC_t = \alpha_0 + \alpha_1 LFPD_t + \alpha_2 LACP_t + \alpha_3 LRFR_t + \alpha_4 LMTP_t + \alpha_5 LMTR_t + U_t \quad (8)$$

RESULT AND DISCUSSION

Data Analysis

Unit Root Test

The Augmented Dickey Fuller (ADF) unit root test is use to establish the stationarity of the time series data used in the study. The result in table 1 are shown below;

Variables	Levels		First Difference		Order of Integration	P-value
	ADF Statistics	5% Critical Value	ADF Statistics	5% Critical Value		
POR	-2.319383	-2.951125	-7.024801	-2.954021	I(1)	0.0000
LGDP_PC	-1.826345	-2.951125	-4.311688	-2.954021	I(0)	0.0018
LFPD	-0.898623	-2.957110	-7.666076	-2.950411	I(1)	0.0000
LACP	-0.671632	-2.963972	-2.987287	-2.963972	I(1)	0.0476
LRFR	-3.668148	-2.986225			I(0)	0.0114
LMTP	-1.551790	-2.957110	-4.060781	-2.967110	I(1)	0.0036
LMTR	-4.504851	-3.004861			I(0)	0.0019

Source: *Author Computation 2025** Level of significance at 5%

This study employs the Augmented Dickey-Fuller (ADF) unit root tests to check the order of integration of the variables and the results are presented in Table 1 The results of Augmented Dickey-Fuller (ADF) showed that the variables are integrated in different order or a combination of I(0) and I(1) series. The ADF result revealed that LRFR LGDPPC, and MTR were stationary at levels 1(0) while, POR, LFPD, LACP, and LMTP, are stationary after first differencing 1(1). This condition makes the Autoregressive Distributive Lag (ARDL) Bounds test approach to co-integration appropriate for investigating the long-run relationship among these variables.

Bound Test to Co-integration Result for Model One

Table 2: ARDL Bound Test Co-integration Result for Model One (FPD, ACP, RFR, MTP, MTR)

Test Statistics	Value	K
F-statistics	7.546520	5
Significance	I (0)	1(1)
10%	2.57	3.86
5%	3.12	4.60
1%	4.53	6.37

Source: *Authors computation 2025*

From table 2 the bound test result indicates that there exist long run relationships amongst the variables as the F-statistic value of 7.546520 exceeds both the lower and upper bound critical values. Thus, we therefore reject the null hypotheses of no long run relationship and accept its alternative. This means that there is a long-run relationship between blue economy and poverty in Nigeria.

Short and Long-Run Estimation Results for Model One (POR)

The results of the short and long-run dynamics association of model one are presented in table 3 below

Table 3: ARDL Short and Long-run Result for Model One (POR)

Short Run Coefficient				
Variable	Coefficient	Std. Error	t-Statistics	Prob
LOG(FPD(-1))	0.215251	7.114451	0.030255	0.9763
LOG(ACP)	0.768506	0.290499	2.645470	0.0202
LOG(RFR)	0.981838	0.297096	3.304785	0.0057
LOG(MTP(-1))	0.261932	0.235060	1.144320	0.2853
LOG(MTR)	1.84E-08	5.71E-09	3.220359	0.0067
ECM(-1)	-0.531254	0.106639	-4.981849	0.0003
Long Run Coefficient				
Variable	Coefficient	Std. Error	t-Statistics	Prob
LOG(FPD)	-0.690720	0.225880	-3.057907	0.0002
LOG(ACP)	0.482555	0.361805	1.333746	0.1943
LOG(RFR)	-0.270690	0.088825	3.047454	0.0005
LOG(MTP)	0.813200	0.308499	2.635991	0.0026
LOG(MTR)	4.64E-09	1.76E-09	0.264190	0.7938
C	-0.423143	0.085336	-4.958531	0.0003
Adj R²=0.46350; F- Stat, = 2.583920 (0.045383)); DW =1.921806				

Source: Authors computation using E-view 13 2025

The coefficient estimate for the error correction term, ECM (-1) has a negative value and is significant at the 0.05 level. It suggests that the model will reach long-run equilibrium at a rate of 0.48% every year. This means that a yearly adjustment speed of 0.53% may fix the mistake from the previous year. The independent variables (LFPD, LACP, LRFR, LMTP & LMTR) explain 46% of the total variance in the dependent variable (POR), according to the adjusted R-Square (R²) value. As a whole, the model is noteworthy since the F-statistic is significant at the 5% level of significance. Without serial correlation, the model would not work, according to the Durbin-Watson statistics of 1.921806, which is close to 2.

Table 3 displays the model's short-and long run outcome. The coefficient of the logarithm value of aquaculture production (LACP); renewable freshwater resources (LRFR), and the log value of marine tourism (LMTR) has a significant positive effect on poverty rate (POR) while the logarithm value of Fishery production (LFPD), and Marine transportation (LMTP) reported a positive but insignificant relationship with poverty rate (POR) in Nigeria. in the short-run. Table 3, shows the outcome of the long-run result that the coefficient of the logarithm value of fishery production (LFPD); and renewable freshwater resources (LRFR) has a significant negative effect on poverty rate (POR) while the logarithm value of Marine transportation (LMTP) reported a positive and significant relationship with poverty rate (POR) in Nigeria. However, the log value of aquaculture production (LACP), and the log of value of marine tourism (LMTR) has a positive but insignificant effect on poverty rate (POR) in the long-run.

Diagnostic Test

Table 4.: Ramsey Reset Test, Serial Correlation LM Test and Homoscedasticity Test Results

	F-Statistic	Prob-Value
Ramsey Reset Test	188.9185	0.4693
Breusch-Godfrey Serial Correlation LM Test	4.641420	0.0605
Breusch-Pagan-Godfrey Heteroskedasticity Test	2.551178	0.0874

Source: Authors computation 2025

From Table 4, the results of the diagnostic test show that the linearity test using Ramsey Reset test indicates that the f-statistic (188.9185) with computed p-value of 0.4693 which is greater than 5 percent (0.05) critical value, hence the study reject the null hypothesis and conclude that the model is correctly specified.

The result of the Serial or Autocorrelation Test using Breusch-Godfrey Serial Correlation LM Test shows that the f-statistic is 4.641420, with a Chi-Square probability value is 0.0605. This indicates that the probability value of about 6 percent (0.0605) is greater than 5 percent (0.05) critical value; hence the study confirms no serial correlation in the model.

The result of the heteroscedasticity test using Breusch-Pagan-Godfrey test shows that the f-statistic is 2.551178 with a Chi-Square probability value of 0.0874. The result suggests that there is no evidence of heteroskedasticity in the model since the probability Chi-square value is more than 5 percent ($P > 0.05$). So, residuals do have constant variance which is desirable in regression meaning that residuals are Homoscedastic.

Figure 1: Normality Test

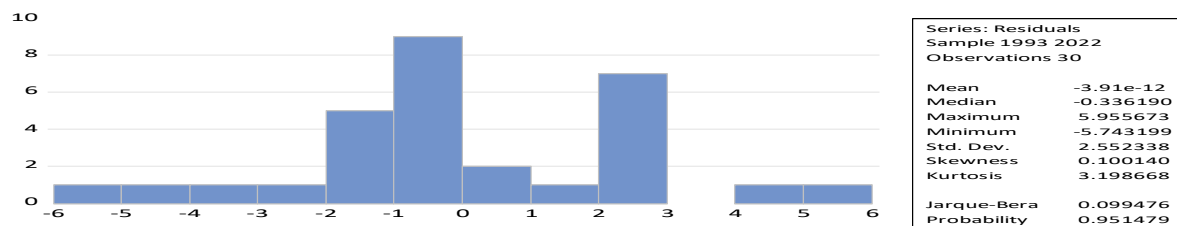


Figure 1, shows summary of the normality test with Jarque-Bara value of 0.099476 and a corresponding probability value of 0.951479 more than 0.05 level of significance, indicating that the residuals are normally distributed.

Figure 2: Stability Test

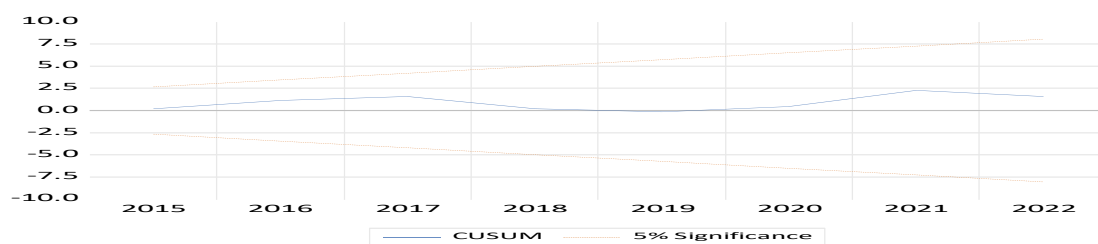


Figure 2, shows a summary of the stability of the model. The graph showed that the model is stable, this is evident by the fact that the blue line inside the graph is in between the two red lines. This also indicates that it is less than 0.05 level of significance.

Co-integration Test

Table 5 ARDL Bound Test

Test Statistics	Value	K
F-statistics	5.395053	5
Significance	I (0)	1(1)
10%	2.57	3.85
5%	3.12	4.60
1%	4.53	6.37

Source: Authors computation 2025

From table 5 the bound test result indicates that there exist long run relationships amongst the variables as the F-statistic value of 5.395053 exceeds both the lower and upper bound critical values. Thus, we therefore reject the null hypotheses of no long run relationship and accept its alternative. This means that there is a long-run relationship between blue economy and gross domestic product per capita in Nigeria.

Short and Long-Run Estimation Results for Model Two (LGDPPC)

The results of the short and long-run dynamics association of model one are presented in table 3 below

Table 6: ARDL Short and Long-run Result for Model Two (LGDPPC)

Short Run Coefficient				
Variable	Coefficient	Std. Error	t-Statistics	Prob
LOG(FPD(-1))	0.560366	0.138440	4.047723	0.0014
LOG(ACP(-1))	0.173805	0.037939	4.581176	0.0005
LOG(RFR)	0.810297	0.266944	3.035459	0.0096
LOG(MTP)	0.464474	0.953192	0.237803	0.8157
LOG(MTR)	1.16E-09	2.55E-10	4.534047	0.0006
ECM(-1)	-0.404113	0.063750	-6.339038	0.0000
Long Run Coefficient				
Variable	Coefficient	Std. Error	t-Statistics	Prob
LOG(FPD)	0.350227	0.538826	0.649981	0.5216
LOG(ACP)	-0.938039	0.290095	-3.233561	0.0034
LOG(RFR)	0.653226	0.279787	2.334729	0.0279
LOG(MTP)	0.185811	0.749464	0.247926	0.8062
LOG(MTR)	2.36E-09	7.85E-10	3.001871	0.0060
C	0.406961	0.063883	6.370418	0.0000
Adj R²=0.693869; F- Stat, = 5.108161 (0.002515); DW =2.279546				

Source: Authors computation using E-view 13 2025

The coefficient estimates for the error correction term, ECM (-1) has a negative value and is significant at the 0.05 level. It suggests that the model will reach long-run equilibrium at a rate of 0.40% every year. This means that a yearly adjustment speed of 0.40% may fix the mistake from the previous year. The independent variables (LFPD, LACP, LRFR, LMTP & LMTR) explain 69% of the total variance in the dependent variable (PLGDPPC), according to the adjusted R-Square (R²) value. As a whole, the model is noteworthy since the F-statistic is

significant at the 5% level of significance. Without serial correlation, the model would not work, according to the Durbin-Watson statistics of 2.279546, which is close to 2.

Table 3 displays the model's short-and long run outcome. The coefficient of the logarithm value of fishery production (LFPD), log value of aquaculture production (LACP); log value of renewable freshwater resources (LRFR), and the log value of marine tourism (LMTR) has a significant positive effect on the log value of gross domestic product per capita (LGDPPC) while the logarithm value of Marine transportation (LMTP) reported a positive but insignificant relationship with the log value of gross domestic product per capita (LGDPPC). Table 3, shows the outcome of the long-run result that the coefficient of the logarithm value of renewable freshwater resources (LRFR) and the log value of marine tourism (LTR) has a significant positive effect on the log value of gross domestic product per capita (LGDPPC), while the log value of aquaculture production (LACP) had a negative but significant relationship with the log value of gross domestic product per capita (LGDPPC). However, the log value of fishery production (LFPD), and marine transportation (LMTP) are positive but insignificantly related with the log value of gross domestic product per capita (LGDPPC) in the long-run.

Diagnostic Test

Table 7: Ramsey Reset Test, Serial Correlation LM Test and Homoscedasticity Test Results

	F-Statistic	Prob-Value
Ramsey Reset Test	0.251804	0.6312
Breusch-Godfrey Serial Correlation LM Test	1.474041	0.3015
Breusch-Pagan-Godfrey Heteroskedasticity Test	0.651263	0.7956

Source: Authors computation 2025

From Table 7, the results of the diagnostic test show that the linearity test using Ramsey Reset test indicates that the f-statistic (0.251804) with computed p-value of 0.6312 which is greater than 5 percent (0.05) critical value, hence the study reject the null hypothesis and conclude that the model is correctly specified.

The result of the Serial or Autocorrelation Test using Breusch-Godfrey Serial Correlation LM Test shows that the f-statistic is 1.474041, with a Chi-Square probability value is 0.3015. This indicates that the probability value of about 30 percent (0.3015) is greater than 5 percent (0.05) critical value; hence the study confirms no serial correlation in the model.

The result of the heteroscedasticity test using Breusch-Pagan-Godfrey test shows that the f-statistic is 0.651263 with a Chi-Square probability value of 0.7956. The result suggests that there is no evidence of heteroskedasticity in the model since the probability Chi-square value is more than 5 percent ($P > 0.05$). So, residuals do have constant variance which is desirable in regression meaning that residuals are Homoscedastic.

Figure 3: Normality Test

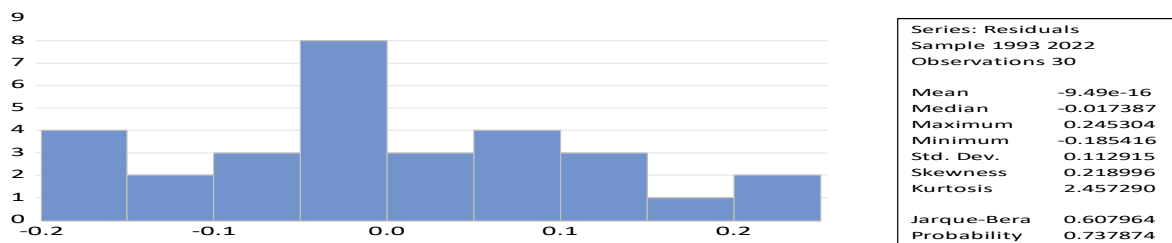


Figure 3, shows summary of the normality test with Jarque-Bara value of 0.607964 and a corresponding probability value of 0.757874 more than 0.05 level of significance, indicating that the residuals are normally distributed.

Figure 4: Stability Test

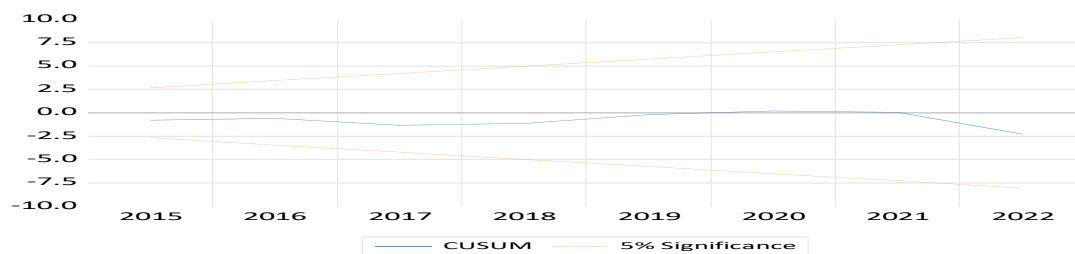


Figure 4, shows summary of the stability of the model. The graph showed that the model is stable, this is evident to the fact that, the blue line inside the graph is in between the two red lines. This also indicates that it is less than 0.05 level of significance.

Discussion of Findings

Fishery Production and Poverty Rate in Nigeria

The long-run results of the regression analysis using the Auto-Regressive Distributive Lag (ARDL) method showed that Fishery Production (FPD) has a negative association with poverty (POR) in the long-run. It supports economic theory. It was expected that increased fishery production creates more job opportunities in harvesting, processing, and distribution, thus helping to reduce poverty levels and support economic stability, particularly in coastal and rural areas. Also, the result from the p-value shows that fishery production (FPD) has a statistically significant impact on poverty. Therefore, the analysis concludes that the null hypothesis that FPD and POR are not significantly related is incorrect.

Aquaculture Production and Poverty Rate in Nigeria

A positive association between aquaculture production (ACP) and poverty (POR) was inferred in the long-run using regression analysis. It is not consistent with economic theory that aquaculture production has a positive connection with poverty (POR). It was expected that increase in aquaculture production generates job opportunities in areas such as breeding, feeding, and processing, thereby helping to reduce unemployment and support economic development, especially in rural communities. Aquaculture production (ACP) has a statistically insignificant effect on poverty (POR), according to the p-value of the finding. Therefore, the

analysis concludes that the null hypothesis that aquaculture production (ACP) and poverty (POR) have no significant link is correct.

Renewable Freshwater Resources and Poverty Rate in Nigeria.

Also, in the long-run 'worth of data, we see that the link between renewable freshwater resources (RFR) and poverty (POR) is negative. Economists' predictions about a negative correlation between renewable freshwater resources (RFR) and poverty (POR) is spot on. It is anticipated that access to reliable freshwater resources can boost productivity and economic growth, thereby reduce poverty and promote sustainable livelihoods. The result's p-value, however, suggests that renewable freshwater resources (RFR) have a statistically significant effect on poverty (POR). Accordingly, the study's results disapprove the null hypothesis that the correlation between the RFR and POR is not statistically significant.

Marine Transport and Poverty Rate in Nigeria

From what we can see, in the long-run, there is a positive link between marine transport (MTP) and poverty (POR). Economic theory predicts a negative correlation between MTP and POR. It is believed that by facilitating trade and economic activity, marine transport helps lower poverty and supports economic growth, particularly in coastal regions. Marine transport (MTP) have a statistically significant effect on poverty (POR), according to the p-value of the outcome. Since the research found a significant link between marine transport (MTP) and poverty (POR), the null hypothesis that there is no relationship between the two is not true.

Marine Tourism and Poverty Rate in Nigeria

From what we can see, in the long-run, there is a positive link between marine tourism (MTR) and poverty (POR). Economic theory predicts a negative correlation between MTR and POR. It is believed that by facilitating trade and economic activity, marine tourism helps lower poverty and supports economic growth, particularly in coastal regions. Marine tourism (MTR) have a statistically insignificant effect on poverty (POR), according to the p-value of the outcome. Since the research found a significant link between marine tourism (MTR) and poverty (POR), the null hypothesis that there is no relationship between the two is true

Blue Economy and Gross Domestic Product Per Capita in Nigeria.

Fishery Production and Gross Domestic Product Per Capita in Nigeria

The regression analysis using the Auto-Regressive Distributive Lag (ARDL) method showed that fishery production (FPD) has a positive association with gross domestic product per capita (GDPPC) in the long -run. It does supports economic theory. It was expected that increased fishery production creates more job opportunities in harvesting, processing, and distribution, thus helping to increase gross domestic product per capita and support economic stability, particularly in coastal and rural areas. Also, the result from the p-value shows that fishery production (FPD) has a statistically insignificant impact on gross domestic product per capita. Therefore, the analysis concludes that the null hypothesis that FPD and GDPPC are not significantly related is correct.

Aquaculture Production and Gross Domestic Product Per Capita in Nigeria

A negative association between aquaculture production (ACP) and gross domestic product per capita (GDPPC) was inferred in the long -run using regression analysis. It is consistent with

economic theory that aquaculture production has a positive connection with gross domestic product per capita (GDPPC). It was expected that increase in aquaculture production generates job opportunities in areas such as breeding, feeding, and processing, thereby helping to improve the average income of citizens and support economic development, especially in rural communities. Aquaculture production (ACP) has a statistically significant effect on gross domestic product per capita (GDPPC), according to the p-value of the finding. Therefore, the analysis concludes that the null hypothesis that aquaculture production (ACP) and gross domestic product per capita (GDPPC) have no significant link is incorrect.

Renewable Freshwater Resources and Gross Domestic Product Per Capita in Nigeria

Also, in the long-run worth of data, we see that the link between renewable freshwater resources (RFR) and gross domestic product per capita (GDPPC) is positive. Economists' predictions about a positive correlation between renewable freshwater resources (RFR) and gross domestic product per capita (GDPPC) are spot on. It is anticipated that access to reliable freshwater resources can boost productivity and economic growth, thereby boosting gross domestic product per capita and promoting sustainable livelihoods. The result's p-value, however, suggests that renewable freshwater resources (RFR) have a statistically significant effect on gross domestic product per capita (GDPPC)). Accordingly, the study's results disapprove the null hypothesis that the correlation between the RFR and GDPPC is not statistically significant.

Marine Transport and Gross Domestic Product Per Capita in Nigeria

From what we can see, in the long -run that there is a positive link between marine transport (MTP) and gross domestic product per capita (GDPPC). Economic theory predicts a positive correlation between MTP and GDPPC. It is believed that by facilitating trade and economic activity, marine transport helps enhance gross domestic product per capita and supports economic growth, particularly in coastal regions. Marine transport (MTP) has a statistically insignificant effect on gross domestic product per capita (GDPPC), according to the p-value of the outcome. Since the research found an insignificant link between marine transport (MTP) and gross domestic product per capita (GDPPC), the null hypothesis that there is no relationship between the two is true.

Marine Tourism and Gross Domestic Product Per Capita in Nigeria

From what we can see, in the long -run that there is a positive link between marine transport (MTP) and gross domestic product per capita (GDPPC). Economic theory predict a positive correlation between MTR and GDPPC. It is believed that by facilitating trade and economic activity, marine transport helps enhance gross domestic product per capita and supports economic growth, particularly in coastal regions. Marine tourism (MTR) have a statistically significant effect on gross domestic product per capita (GDPPC), according to the p-value of the outcome. Since the research found an insignificant link between marine tourism (MTR) and gross domestic product per capita (GDPPC), the null hypothesis that there is no relationship between the two is no true.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study examined the impact of blue economy on economic development in Nigeria. The findings of the study showed that fishery production, aquaculture production, renewable freshwater resources, and marine transport had significant impact on poverty, and gross domestic product per capita. Based on the findings of the study, it is concluded that blue economy significantly contributes to the economic development in Nigeria.

Recommendations

- i. The Federal Ministry of Agriculture and Rural Development prioritize inclusive, eco-friendly fishery and aquaculture programme to boost income, create jobs, and foster long-term development.
- ii. The Federal Ministry of Water Resources (FMWR) and the River Basin Development Authorities (RBDAs) should prioritize investments in dams, reservoirs, irrigation systems, and water treatment plants to maximize the availability and efficient use of renewable freshwater resources.
- iii. The Federal Ministry of Agriculture and Rural Development (FMARD) and the National Agricultural Land Development Authority (NALDA) should invest in the development of hatcheries, feed mills, and processing facilities to boost aquaculture production and reduce reliance on imports.
- iv. Finally, the Nigerian Maritime Administration and Safety Agency (NIMASA) and the National Inland Waterways Authority (NIWA) should support local shipbuilding and ship repair industries through incentives, funding, and training programs.
- v. The Federal Ministry of Power, Ministry of Blue Economy, and the Nigerian Electricity Regulatory Commission (NERC) should design integrated policies that link investments in fisheries, aquaculture, renewable freshwater, marine transport, and marine tourism to rural electrification programs, ensuring that gains in the blue economy translate into improved access to electricity.

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